Business Process Engineering
BS-SE (13)

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Question 1 (a):
Answer: The general process chart summarizes the current process, the redesigned process and the expected improvements from proposed changes.

Characterizes the process by

- The number of activities by category
- the amount of time spent in each activity category
- the corresponding percentage of the total processing time spent on each category

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Question 1 (b):
Answer:

Disadvantages:

- Only considers average activity times.
- If the process includes several variants with different paths each variant needs its own activity chart.
- Cannot depict parallel activities.

Question 1 (c):
Answer:

LD Formula: LD_ Score (i, j) = Load (i, j) * Distance (i, j)

Calculation for LD of two distances

Given		Current Design		Proposed Design	
Centres	**Load**	**Distance**	**LD Score**	**Distance**	**LD Score**
(A, B)	20	2	40	1	20
(A, D)	20	1	20	1	20
(A, F)	80	3	240	3	240
(B, C)	10	2	20	1	10

(B, E)	75	3	225	1	75
(C, D)	15	1	15	3	45
(C, F)	90	1	90	1	90
(C, E)	70	2	140	1	70
TOTAL	-	-	**790**	-	**570 (min)**

The LD for the proposed design has 570 min which is better then current design.

Question 2 (a):
Answer:

Formula: WIP **=** min_1*job_1 + min_2*job_2 + min_3*job_3 …. min_n*job_n/Sum(mins)

Average WIP = 3*10 + 6*20 + 5*20 + 2*10 / 10+20+20+10
=> 4.5 Jobs

Question 2 (b):
Answer:

Formulas:

- Activity Time= Waiting Time + Process Time
- CT (for multiple paths) = p1T1+p2T2+…….+ pmTm= $\sum_{i=1}^{m} piTi$

Where

- p_i = The probability that a job is routed to path i
- T_i = The time to go down path i

CT Efficiency= Theoretical Cycle Time / CT

Given calculated table

Activity	Waiting Time (min)	Process Time (min)	Activity Time (min)
A	20	12	32
B	15	18	33
C	5	30	35
D	12	17	29
E	3	12	15
F	5	25	30
G	8	7	15
H	5	10	15
I	15	25	40
J	5	20	25
K	4	10	14

CT = 10+ 0.1 *20+ 25+0.9*24+0.15*(12+23+35) +15 = 84.1 min
Process time= 12+0.1*18+17+0.9*30+0.15*(12+25+7) +10 = 74.4 min

Now, To compute the CT Efficiency here below;

CT Efficiency = 74.4 / 84.1 = 0.88

Question 3:

Answer: Defining:

Ni = no of jobs taking path i
Pi = probability
Ni = n • p_i

Step 1: Unit load for resource j = $\sum_{i=9}^{m} \bullet Ti$

Step 2: Unit capacity for resource j = 1/unit load for resource

Step 3: Pool capacity = M • Unit capacity = M/unit load

Resource	Unit Load(Min)	Unit Capacity Jobs/min	Available Resources	Pool Capacity Jobs/min
R1	2+5*0.3+2=55	1/5.5	2	2/2.5 = 0.36
R2	8+1.1*(3+4)=15.7	1/15.7	2	2/15.7 = 0.13
R3	4+2=6	1/6	1	1/6 = 0.17

Question 4:
Answer:

TOC Methodology:

- **Identify**: Identify the system constraints
- **Exploit**: Determine how to exploit the constraints
- **Subordinate**: reviewing other activities in the process to ensure that they are aligned
- **Elevate**: Elevate the constraints to improve performance
- **Repeat**: if the current constraints are eliminated return to step 1
